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EXAMINER	
MAIS, MARK A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/919,845	Applicant(s) BARKAI ET AL.	
	Examiner Mark A. Mais	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☒ Claim(s) *9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 23, 2007 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, claim 9, as understood by the examiner, claims virtual device components which must necessarily have their

own virtual processors and virtual memories **[absent from the specification]** which allow them to independently make decisions and pass messages to other virtual components.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1, 2 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Nordenstam et al. (USP 6,687,748).

7. With regard to claims 1 and 8, Nordenstam et al. discloses determining the path that a network message would take among network devices in a computer network **[simulates calls, routing, and establishments procedures (interpreted as simulated network messages), col. 12, lines 56-62]** the method comprising:

Providing a plurality of device components to model a physical computer network, each of said device components modeling an aspect of a network device of said physical computer network **[modeling the virtual network based on the multiple real links, col. 10, lines 3-7; Figs. 7a-d, different network topologies]**;

simulating sending a network message **[simulates calls, routing, and establishments procedures (interpreted as simulated network messages), col. 12, lines 56-62]** within said model of said computer network **[virtual network, col. 5, lines 27-35]** from a source device component modeling one of said network devices of said physical network **[Figs. 7a-d, Source A]** to a destination device component **[Figs. 7a-d, Destination B]** along a device component path **[Figs. 7a-d, the path between Source A and Destination B]**,

wherein said simulated message **[simulates calls, routing, and establishments procedures (interpreted as simulated network messages), col. 12, lines 56-62]** only traverses any of said devices which model said network devices of said physical computer network **[only routed virtually along the best route, col. 9, lines 15-19; can even use different system configuration, col. 11, lines 1-5]** and

recording the device components traversed by said simulated message within said model of said physical computer network, thereby determining path that said network message would take among said network devices in said physical computer network as well as the validity of the

path **[interpreted as the path the network's simulated messages go for simulated calls, routing, and establishment procedures (setup/teardown), col. 12, lines 56-62; thus, traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**.

8. With regard to claim 2, Nordenstam et al. discloses further comprising

providing the model with a plurality of agents **[modeling the virtual network based on the multiple real links, col. 10, lines 3-7; Figs. 7a-d, different network topologies]**

each agent **[modeling the virtual network based on the multiple real links, col. 10, lines 3-7]** corresponding to a destination network element **[Figs. 7a-d, Destination B]** of said computer network comprising a plurality of network elements, and

said plurality of device components (DC) **[modeling the virtual network based on the multiple real links, col. 10, lines 3-7; Figs. 7a-d, different network topologies]**, each of said device components modeling at least one aspect of one of said network elements, said aspect being either of a physical and a functional characteristic of said network element **[can simulate calls, routing, and establishment procedures (setup/teardown), col. 12, lines 56-62; thus, traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**,

wherein each of said agents comprises a plurality of said device components **[modeling the virtual network based on the multiple real links, col. 10, lines 3-7; Figs. 7a-d, different network topologies]**, and

wherein at least two of said device components **[Figs. 7a-d, Source A and Destination B]** within at least one of said agents are logically interconnected **[Figs. 7a-d, different network topologies]**, each logical interconnection corresponding to either of a physical and a functional interconnection found within or between any of said network elements **[modeling the virtual network based on the multiple real links, col. 10, lines 3-7; Figs. 7a-d, different network topologies]**.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nordenstam et al. as applied to claims 1, 2, and 8 above, and further in view of Hao et al. (USP 6,728,214).

11. With regard to claims 3-4, Nordenstam et al. discloses a that the simulating sending step **[simulates calls, routing, and establishments procedures (interpreted as simulated network messages), col. 12, lines 56-62]** comprises each device component along the device component path traversed by the message **[traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**. Nordenstam et al. discloses

that the simulated device components performs routing (and is therefore interpreted as a router) **[interpreted as the path the network's simulated messages go for simulated calls, routing, and establishment procedures (setup/teardown), col. 12, lines 56-62; thus; traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**.

Nordenstam et al. does not specifically disclose identifying an intermediate device component along the device component path to which the message is to be passed and passing the message and an identifier of the intermediate device component to an immediately next device component in accordance with network routing rules. However, Hao et al. discloses testing network routers by simulating the network topologies **[see Title and Abstract]**. Hao et al. randomly inserts/deletes either an edge (connection), router-node or network node, checks the network topology and routing tables, and further checks the packet forwarding behavior **[col. 4, line 54 to col. 5, line 35; especially with IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40]**. A packet (such as an IP packet), sent from a first router, via a route containing multiple routers, must be received correctly by the destination router **[col. 7, lines 10-19]**. Since the router-under-test (RUT) has a changing network topology, it must constantly simulate updating the presence of device components [e.g., routing tables], then possibly the absence of device components via a network topology table **[col. 4, lines 30-36]** as if it were in a real network **[col. 3, lines 31-35]**, and, therefore, whether the tested router is complying with the network routing rules. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the router of Nordenstam et al. to include the specific functionality of the router-testing of Hao et al. because such a testing method would allow the network

management system to be properly tested for scalability, performance, and reliability while still not incurring the monetary and time burdens that accompany all the network devices in a network environment **[see Nordenstam et al., col. 1, lines 2, lines 13-25]**.

12. With regard to claim 5, Nordenstam et al. discloses a that the simulating sending step **[simulates calls, routing, and establishments procedures (interpreted as simulated network messages), col. 12, lines 56-62]** comprises each device component along the device component path traversed by the message **[traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**. Nordenstam et al. discloses that the simulated device components performs routing (and is therefore interpreted as a router) **[interpreted as the path the network's simulated messages go for simulated calls, routing, and establishment procedures (setup/teardown), col. 12, lines 56-62; thus, traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**.

Nordenstam et al. does not specifically disclose identifying the intermediate device component within the same network layer. However, Hao et al. discloses testing network routers by simulating the network topologies **[see Title and Abstract]**. Hao et al. randomly inserts/deletes either an edge (connection), router-node or network node, checks the network topology and routing tables, and further checks the packet forwarding behavior **[col. 4, line 54 to col. 5, line 35; especially with IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40]**. A packet (such as an IP packet), sent from a first router, via a route containing multiple routers, must be received correctly by the destination router **[col. 7, lines 10-19]**. Since the router-under-

test (RUT) has a changing network topology, it must constantly simulate updating the presence of device components [e.g., routing tables], then possibly the absence of device components via a network topology table **[col. 4, lines 30-36]** as if it were in a real network **[col. 3, lines 31-35]**, and, therefore, whether the tested router is complying with the network routing rules. Thus, Hao et al. discloses identifying the intermediate device component within the same network layer because it inserts/deletes connections and then checks the network topology, routing tables, and checks packet forwarding **[col. 4, line 54 to col. 5, line 35; especially with IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40]**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the router of Nordenstam et al. to include the specific functionality of the router-testing of Hao et al. because such a testing method would allow the network management system to be properly tested for scalability, performance, and reliability while still not incurring the monetary and time burdens that accompany all the network devices in a network environment **[see Nordenstam et al., col. 1, lines 2, lines 13-25]**.

13. With regard to claim 6, Nordenstam et al. discloses a that the simulating sending step **[simulates calls, routing, and establishments procedures (interpreted as simulated network messages), col. 12, lines 56-62]** comprises each device component along the device component path traversed by the message **[traffic is modeled on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11]**. Nordenstam et al. discloses that the simulated device components performs routing (and is therefore interpreted as a router) **[interpreted as the path the network's simulated messages go for simulated calls, routing, and establishment procedures (setup/teardown), col. 12, lines 56-62; thus, traffic is modeled**

on the virtual network where the simulated links correspond to real links, col. 9, line 66 to col. 10, line 11].

Nordenstam et al. does not specifically disclose receiving the message at the immediately next device component and performing different functions based on what network layer the next device component is in. However, Hao et al. discloses testing network routers by simulating the network topologies **[see Title and Abstract]**. Hao et al. randomly inserts/deletes either an edge (connection), router-node or network node, checks the network topology and routing tables, and further checks the packet forwarding behavior **[col. 4, line 54 to col. 5, line 35; especially with IP protocols such RIP, OSPF, and BGP, col. 5, lines 38-40]**. A packet (such as an IP packet), sent from a first router, via a route containing multiple routers, must be received correctly by the destination router **[col. 7, lines 10-19]**. Since the router-under-test (RUT) has a changing network topology, it must constantly simulate updating the presence of device components [e.g., routing tables], then possibly the absence of device components via a network topology table **[col. 4, lines 30-36]** as if it were in a real network **[col. 3, lines 31-35]**, and, therefore, whether the tested router is complying with the network routing rules.

Thus, Hao et al. discloses receiving the message at the immediately next device component **[Fig. 12, simulated network topology shows the multiples routers between the RUT and the further routers/networks]**; if the message is received from a device component at a higher network layer **[for BGP testing, the testing involves setting up a higher layer TCP connection, then sending update packets to the RUT, col. 11, lines 12-18]**; placing information onto an information stack as may be needed by any device component along the device component path to identify other device components along the device component path to

which the message is to be passed **[Each BGP router maintains its preferred paths to all possible destinations (not necessarily the shortest path), the BGP router must advertise these paths to its adjacent multiple routers, col. 9, lines 48-53. Since the information identifying intermediate nodes is extracted via the virtual/testing environment, examiner interprets placing the information onto a stack as passing the intermediate node information to the RUT from the original device component path (e.g., Fig. 12, from the farthest BGP router to the RUT); thus, each possible destination node is exchanged, col. 9, lines 60-65]**; and if the message is received from a device component at a lower network layer **[in OSPF, lower level LSA advertisements are sent out concerning each router's own network connections, col. 8, lines 57-65]**; removing information from the information stack needed to identify a subsequent intermediate device component along the device component path to which the message is to be passed **[each OSPF router exchanges "hello" packets to maintain adjacency and LSAs to describe its own network connections and learned routes, col. 8, lines 57-65. Since the information identifying intermediate nodes is extracted via the virtual/testing environment, the examiner interprets removing information from the stack as passing the intermediate node information to the RUT from the original device component path (e.g., Fig. 12, from the farthest OSPF router to the RUT); thus, the current network topology is exchanged, col. 8, line 66 to col. 9, line 4.]**. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the router of Nordenstam et al. to include the specific functionality of the router-testing of Hao et al. because such a testing method would allow the network management system to be properly tested for scalability, performance, and reliability while still not incurring the monetary and time

burdens that accompany all the network devices in a network environment **[see Nordenstam et al., col. 1, lines 2, lines 13-25]**.

14. With regard to claim 7, Hao et al. further discloses using the removed stack information **[the removed stack information is used to generate the LSA to the RUT and test whether the network topology and learned routes, col. 9, lines 8-39]**.

Allowable Subject Matter

15. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims [as well as the 35 USC 112, paragraph 1 rejection above].

Response to Arguments

16. Applicant's arguments filed have been fully considered but they are not persuasive.

17. With respect to claim 1, Applicant argues that Nordenstam et al. does not determine how to establish a path within a network **[Applicant's Amendment dated July 23, 2007, page 2, paragraph 4]**. Applicant also argues that Nordenstam et al. only suggests using a routing protocol and that Nordenstam et al. recognizes paths which may not have a counterpart in the

real network **[Applicant's Amendment dated July 23, 2007, page 2, paragraph 4]**. The examiner respectfully disagrees.

18. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., (a) a specific method ("how") to establish a path within a network; (b) using a specific routing protocol; and/or (c) establishing only virtual paths which have physical counterparts in a real network) are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

19. Applicant argues that Nordenstam et al. fails to disclose DCs which maintain information concerning functions of the physical network elements and are configured with the information to decide where the simulated message would be forwarded **[Applicant's Amendment dated July 23, 2007, page 2, paragraph 4 to page 3, paragraph 1]**. Applicant also argues that Nordenstam et al. (1) determines multiple routes; (2) is not interested in the actual path as opposed to the best route (tracking a single route); and (3) the "best path" is not determined by the DCs themselves **[Applicant's Amendment dated July 23, 2007, page 3, paragraphs 1-2]**. The examiner respectfully disagrees.

20. First, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies [i.e., (1)

determining only one route; and/or (3) the DCs determining the "best path" (as opposed to the actual path)] are not recited in the rejected claim. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Second, the "actual" path can necessarily be the "best path" [for (2) above] and is so interpreted by the examiner [i.e., there is nothing that precludes the situation where the "best path" and the "actual" path are one and the same].

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

(a) Li et al. (USP 7,242,671), system and method for link-state based proxy flooding of messages in a network.

(b) Van Oldenborgh et al. (USP 7,065,548), System and method for distributed network having a dynamic topology of communicating a plurality of production nodes with a plurality of consumer nodes without intermediate node logically positioned therebetween.

(c) Poisson et al. (USP 7,000,014), Monitoring a virtual private network.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A. Mais whose telephone number is 572-272-3138. The examiner can normally be reached on M-Th 5am-4pm.

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan F. Wing can be reached on 571-272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MAM
July 29, 2007

Wing Fu Chan 8/6/07
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